verse

Verse x NGUYEN WAHED
In Conversation With

Showcased within the digital sector of the Paris Photo 2023 art fair, NGUYEN WAHED presents In Conversation With, a group exhibition that traces the evolution of generative art and various photographic techniques over time.

Spanning various algorithmic generative practices, including works created through machine-learning technologies, and translated into digital art and photography, the exhibition aims to showcase the relationship between generative art, analogue art, photography, and the beauty of combining these art forms.

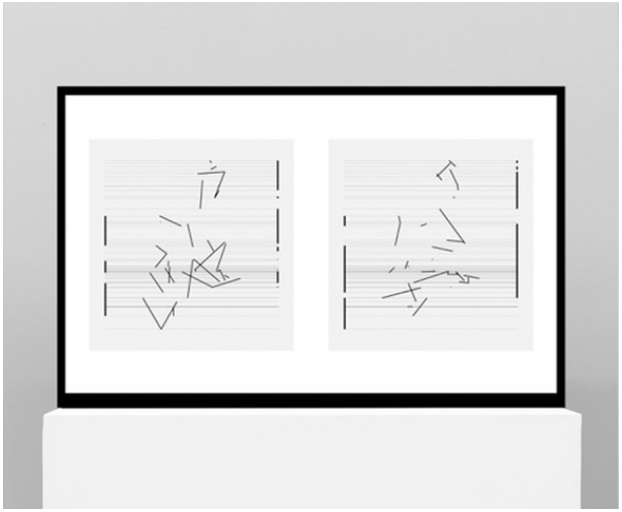




Artists
Manfred Mohr
Matt DesLauriers
Mario Klingemann
Sofia Crespo x Anna Ridler
Marcel Schwittlick
0xDeafbeef

On View
9-12 November
Paris Photo 2023, Booth SD05
Grand Palais Éphémère
Champ-de-Mars. Place Joffre
75007 Paris

In Conversation With presents a curated selection of hardware and software-based works; generative algorithmic plotter drawings, plotter luminograms, chronophotography, AI-based cyanotypes, and cameraless photography. Illustrating the mechanical craftsmanship involved in both generative art and various forms of photography, the show features works by Manfred Mohr, Matt DesLauriers, Marcel Schwittlick, 0xDeafbeef, Mario Klingemann, and Sofia Crespo in collaboration with Anna Ridler.



Manfred Mohr
P1680-B, Artificiata II, 2015

Unique custom machine
Computer-generated real-time algorithmic animation, imac, LCD screen, custom software.

The exhibition celebrates leading contemporary artists, as well as paying homage to the pioneers of generative art, including Manfred Mohr and Mario Klingemann.

Mohr's exploration of computer-generated art took root in the 1960s, initiated by his letter to the French Ministry of Transport to secure access to the computer centre of the Météorologie Nationale in Paris. He was one of the first artists to adopt computer algorithms as a tool for creating art, exploring the intersection of mathematics, geometry, and aesthetics. His work often involves the use of algorithms to generate intricate and mesmerizing visual patterns and shapes. Mohr's artistic practice is deeply rooted in the concept of generative art, where algorithms are used to produce unique and unpredictable outcomes. His creations often involve intricate geometric forms, transforming abstract mathematical concepts into visually captivating artworks. Through his work, Mohr delves into the relationship between order and chaos, exploring how mathematical algorithms can give rise to visually harmonious and intricate patterns.



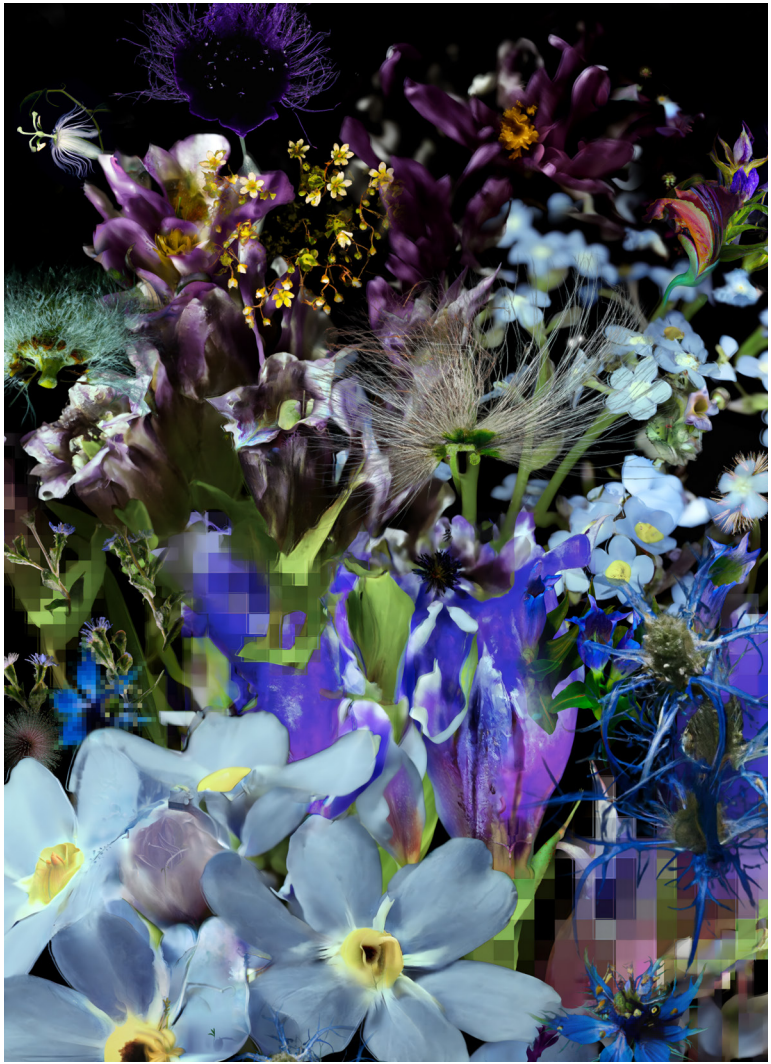
Marcel Schwittlick
Composition #92 (Luminogram), 2023

11 unique luminograms
Laser light on photographic paper
50.8 x 61 cm

DesLauriers and Schwittlick's respective plotter drawings and plotter luminograms illustrate the differences, similarities, and relationship between these techniques.

Through complex algorithms and code, *DesLauriers* generates intricate plotter drawings. His work often involves experimenting with various parameters and algorithms to create intricate, abstract patterns reminiscent of natural forms. His plot drawings explore the tactile sense of algorithmic art, pushing the boundaries of what is possible with code and digital media.

Schwittlick has been exploring how algorithms can be employed in artistic work. Often going from digital to analog and back again, in restless feedback loops, he is now experimenting with the technique of plotter-luminograms, a cameraless photography technique. In his luminograms, the photographs are made by the paper's exposure to a laser light navigated by an algorithmically-controlled plotter in a darkroom setting. After the laser-light's choreography is recorded by the light-sensitive silver halide emulsion, the photo paper is developed normally by the artist, just like regular analog photographs.
- Lucas Rehnman

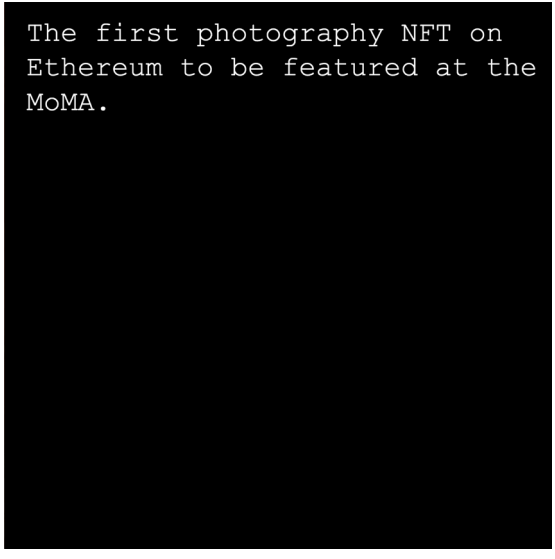


Sofia Crespo and Anna Ridler
83 seeds from a vanishing mountain, 2023

Unique cyanotype installation
148.5 × 210 cm
Upon collection of the physical work, the buyer will also receive 25 unique, tokenised digital works, constructing the main piece.

Crespo and Ridler's works are a collaboration that exemplifies the dynamic relationship between artificial intelligence and human creativity, transcending conventional digital artistic practice, and exploring what goes beyond traditional cyanotype.

Klingemann's series is based on the concept of 'Neurography', which encapsulates his innovative approach of engaging with neural networks, and intricate machine learning algorithms. Through this method, he pioneers a unique form of 'cameraless photography', training his neural networks on diverse source materials, including photographs of bodies. By employing generative adversarial networks (GAN), he is effectively blurring the boundary between human perception and computer-generated art.



OxDeafbeef
First #99879, 2021

Unique digital chronophotography
1/1/10000 series

0xDEAFBEEF's digital chronophotography presents the first on-chain generative text series that explores blockchain as a new medium.

FIRST is a collection of satirical generative texts. It both ridicules and fondly commemorates many aspects of NFT crypto culture circa September, 2021. Texts are generated entirely by an Ethereum smart contract, making this project the first on-chain generative text NFT about NFT "firsts".

Artists

Manfred Mohr is a German artist considered to be a pioneer in the field of digital art. He began using a computer in 1969 because of a growing interest in creating algorithmic art. His early computer works are algorithmic and based on his former drawings with a strong attitude on rhythm and repetition. In 1990 he was awarded the Prix Ars Electronica (Golden Nica) at Ars Electronica festival in Linz, Austria. He maintained an art studio in Paris from 1963 to 1983. Mohr attended Kunst + Werkschule in Pforzheim and École des Beaux-Arts in Paris.

Matt DesLauriers is a Canadian artist, now based in the UK. His practice primarily focuses on code, software, and generative processes. He is also an active contributor to open-source software, building tools and libraries to support creative coding and generative art workflows. He has collaborated with various artists in developing interactive installations, which have been displayed in special events at the Louvre Museum in Paris and the Art Gallery of Ontario in Toronto.

Sofia Crespo is an artist working with a huge interest in biology-inspired technologies. Crespo looks at the similarities between techniques of AI image formation, and the way that humans express themselves creatively and cognitively recognize their world. Her work brings into question the potential of AI in artistic practice and its ability to reshape our understandings of creativity.

in collaboration with

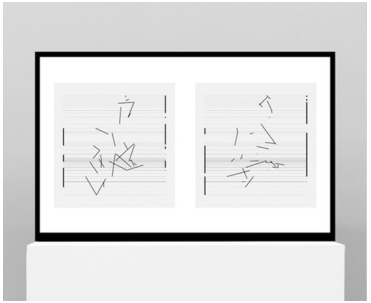
Anna Ridler is an artist and researcher who works with systems of knowledge and how technologies are created in order to better understand the world. She is particularly interested in ideas around the natural world. Her process often involves working with collections of information or data, particularly datasets, to create new and unusual narratives.

Her work has been exhibited at cultural institutions worldwide including the Victoria and Albert Museum, the Barbican Centre, Centre Pompidou, HeK Basel, the ZKM Karlsruhe, Ars Electronica, Sheffield Documentary Festival and the Leverhulme Centre for Future Intelligence.

Mario Klingemann is a German artist best known for his work involving neural networks, code, and algorithms. Klingemann was a Google Arts and Culture resident from 2016 to 2018, and he is considered as a pioneer in the use of computer learning in the arts. His works examine creativity, culture, and perception through machine learning and artificial intelligence, and have appeared at the Ars Electronica Festival, the Museum of Modern Art New York, the Metropolitan Museum of Art New York, the Photographers' Gallery London, the Centre Pompidou Paris, and the British Library.

Marcel Schwittlick is an artist living and working in Berlin, Germany. His work examines the cybernetic aspects of generative systems. Marcel Schwittlick works with multiple media, including digital material, interactive installations, generative poetry, and conceptual video. He studied Computer Science and Computational Art at the University of Arts, Berlin.

0xDeafbeef is an artist and engineer based in Toronto, Canada. Over the past 20 years he has tinkered in diverse areas overlapping art and technology including music, sound recording, computer animation, blacksmithing and generative art. Generative works adopting blockchain technology as both subject and medium have been a focus since 2021. He received his BASc in electrical engineering and MSc from the University of Toronto, where he contributed to internationally recognized research in the field of computer animation.



Manfred Mohr
P1680-B, Artificiata II, 2015

Unique custom machine
Computer-generated real-time algorithmic animation, imac, LCD screen, custom software
On consignment from Galerie Charlot (Paris)
46 x 65 x 11 cm

42 500 USD



Mario Klingemann
Teratoma Series_4, 2017

Unique C-print
Framed analog photo print on Baryta paper
56 x 46 cm

4 000 USD



Mario Klingemann
Teratoma Series_7, 2017

Unique C-print
Unframed analog photo print on Baryta paper
56 x 46 cm

4 000 USD



Mario Klingemann
Teratoma Series_11, 2017

Unique C-print
Unframed analog photo print on Baryta paper
56 x 46 cm

4 000 USD



Mario Klingemann
Teratoma Series_1, 2017

Unique C-print
Framed analog photo print on Baryta paper
56 x 46 cm

4 000 USD



Mario Klingemann
Teratoma Series_13, 2017

Unique C-print
Framed analog photo print on Baryta paper
56 x 46 cm

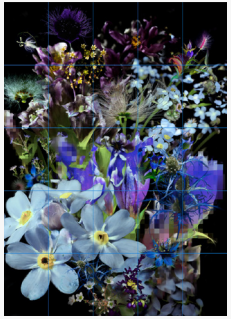
4 000 USD



Mario Klingemann
Teratoma Series_9, 2017

Unique C-print
Framed analog photo print on Baryta paper
56 x 46 cm

4 000 USD



Sofia Crespo x Anna Ridler
83 seeds from a vanishing mountain, 2023

Unique cyanotype installation
148.5 × 210 cm
Upon collection of the physical work, the buyer will also receive 25 unique, tokenised digital works, constructing the main piece.

28 000 USD



Matt DesLauriers
Hachure 228a9 (plot), 2023

Unique plotter drawing
Mechanical pen plotter on handmade cotton paper
30 x 30 cm

4 000 USD



Matt DesLauriers
Hachure 94a7f (plot), 2023

Unique plotter drawing
Mechanical pen plotter on handmade cotton paper
30 x 30 cm

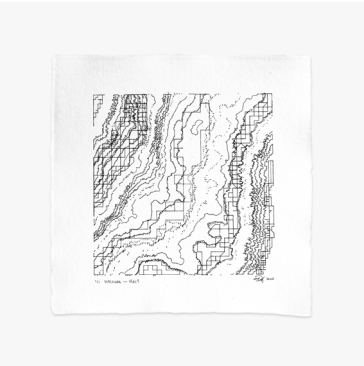
4 000 USD



Matt DesLauriers
Hachure ff1d5 (plot), 2023

Unique plotter drawing
Mechanical pen plotter on handmade cotton paper
30 x 30 cm

4 000 USD



Matt DesLauriers
Hachure 1fdc4 (plot), 2023

Unique plotter drawing
Mechanical pen plotter on handmade cotton paper
30 x 30 cm

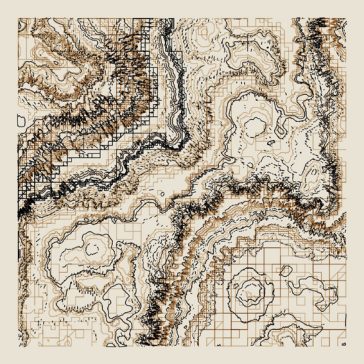
4 000 USD



Matt DesLauriers
Hachure 63f67 (plot), 2023

Unique plotter drawing
Mechanical pen plotter on handmade cotton paper
30 x 30 cm

4 000 USD



Matt DesLauriers
Hachure (digital), 2023

Unique digital works
1/1/25 generative series

Ranked auction



Marcel Schwittlick
Composition #92 (luminogram), 2023

Unique luminogram
Laser light on 255g Adox FP Variotone Baryta paper
50.8 x 61 cm

1 500 USD



Marcel Schwittlick
Composition #92 (luminogram), 2023

Unique luminogram
Laser light on 255g Adox FP Variotone Baryta paper
50.8 x 61 cm

1 500 USD



Marcel Schwittlick
Composition #92 (luminogram), 2023

Unique luminogram
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50.8 x 61 cm

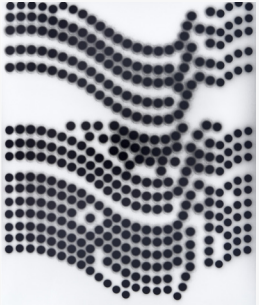
1 500 USD



Marcel Schwittlick
Composition #92 (luminogram), 2023

Unique luminogram
Laser light on 255g Adox FP Variotone Baryta paper
50.8 x 61 cm

1 500 USD



Marcel Schwittlick
Composition #92 (luminogram), 2023

Unique luminogram
Laser light on 255g Adox FP Variotone Baryta paper
50.8 x 61 cm

1 500 USD



Marcel Schwittlick
Composition #92 (luminogram), 2023

Unique luminogram
Laser light on 255g Adox FP Variotone Baryta paper
50.8 x 61 cm

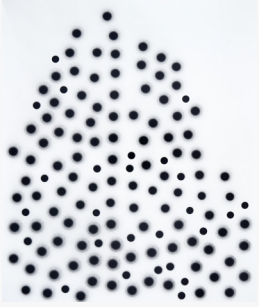
1 500 USD



Marcel Schwittlick
Composition #92 (luminogram), 2023

Unique luminogram
Laser light on 255g Adox FP Variotone Baryta paper
50.8 x 61 cm

1 500 USD



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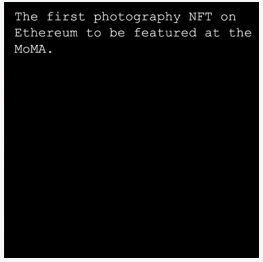
1 500 USD



Marcel Schwittlick
Composition #92 (digital), 2023

Unique digital work
1/1/250 generative series

100 USD



0xDeafbeef
First #99879, 2021

Unique digital chronophotography
1/1/10000 series

Price on request



Manfred Mohr
P2610_B, 2019

Unique custom machine
Computer-generated real-time algorithmic animation, Eizo Screen, MacMini, metal case, custom software. On consignment from Galerie Charlot (Paris)
50 x 50 x 11 cm

42 500 USD

Lucas Rehnman on Marcel Schwittlick's Composition #92

"What becomes a sign depends on the level of our sensitivity" - Lajos Szabó

Marcel Schwittlick has been exploring how algorithms can be employed in artistic work. Often going from digital to analog and back again, in restless feedback loops, he is now experimenting with the technique of plotter-luminograms, a cameraless photography technique. In his luminograms, the photographs are made by the paper's exposure to a laser light navigated by an algorithmically-controlled plotter in a darkroom setting. After the laser-light's choreography is recorded by the light-sensitive silver halide emulsion, the photo paper is developed normally by the artist, just like regular analog photographs.

The series is a playful yet systematic exploration of the potentials of generative art and concrete photography. The main characteristic of concrete art is that it is non-figurative, anti-anecdotal and it is premised on aesthetic autonomy, signifying nothing other than itself. It is an art form that wants to free perception from any a prioris, aiming at opening up new possibilities for rational categories of aesthetic apprehension – an approach that invites us to practice our abilities to decode, differentiate and recognize form and classes of meaning. It brings new perspectives on forms, form relationships and visual orders into consciousness.

In the wake of other conceptual artists, systems artists and generative artists, like them, Schwittlick chose to refuse Romanticism and its influence, deploying strategies to avoid the human hand and all the mystique and sentimentality that pervasively come along with it. That's why he uses code, computers, plotters and other paraphernalia. However, paradoxically, one of his most recurrent sources of entropy are his 10 years-long recorded computer mouse movements. In order to create the marks and lines of the lumonigrams, he used this specific corpus, employing a pseudo-random, or, better said, meta-random selection which isn't done by Schwittlick himself but by his custom software system.

The tool, the mouse, intermediates hand and intention in the abstract realm named technically as "graphical user interface". Motion is detected by the tool and digitised – input is being put into binary data. Digitising is a process of translating; thus, like in every translation, there is an inevitable loss of quality. This applies to all other processes where digital touch analogue. The digital is the smallest common denominator for all media and thus "flattens" everything.

Tools are extensions of our bodies, as Marshall McLuhan concluded, and the computer mouse is no different. But the mouse line recorded by Schwittlick is a rather ambiguous body trace. If recording alters information, as we have seen, these lines are not any kind of romantic trace, like someone's signature or a sumi-e painting. They are ambiguous and impure signs that challenge quick categorizations, they are unconscious, not controlled, not artificial and not deliberately designed. He labels these lines "passive drawing".

The most reliable framework to approach these signs "safely", then, is through the lenses of the algorithm's parameters. The data is classified according to a measure of low and high entropy. "Low entropy" is a class of lines which are more predictable, therefore, formally more simple. "High entropy" has more information, thus, it entails less predictable forms. Schwittlick uses only high entropy ones in this series.

The database of recorded mouse movements constitute an extensive digital library of at-first-glance random scribbles. Are these drawings

really random? What is randomness? John Cage said: “the first question I ask myself when something doesn’t seem to be beautiful is ‘why do I think it is not beautiful?’ and very shortly you discover there’s no reason. If we can conquer that dislike or begin to like what we did dislike, then the world is more open.” Can one say the drawings derived from mouse movements are random? They might appear soulless, perhaps, but are they, really?

Schwittlick conceives these recorded movements as samples from nature, and with his context engineering thinking, refuses to create from scratch in the manner of the genius myth. Whatever comes from nature, what I call the incessant flux of events, is arguably soulful, devine, following John Cage’s steps. The inconspicuous is the degree zero of aesthetics and Schwittlick’s works are suitable media to make this evident.

Black, white and shades of grey resonate in the mind of the beholder: there is no message. Just like colour, concrete photography is irreducible. The colour black leads only to itself – and also to the whole universe. A signifier that leads to another signifier, this is Charles Sanders Peirce’s semiotics, the delta of the modern, of the search for the sign-based self-awareness of art. Schwittlick’s luminograms, like any successful achievement in form and colour, are there to facilitate our demolishing of the common misconception that “beauty” and “art” are subject to be defined or taken for granted as complete systems or defined categories. Putting us to work, these images gently invite us to become more conscious of our inherited and learnable abilities.

Lucas Rehnman is an artist-researcher, curator and writer born in São Paulo (Brazil), currently living and working between Berlin (Germany) and Rio de Janeiro (Brazil). After completing a Masters in Arts in the Public Spheres at édhéa (Switzerland), a program with a strong focus in ecological and decolonial concerns, Rehnman’s work evolved from drawing and painting to open-ended projects in which the relationship between development and environment, culture and land, are examined and problematised. He is also a member of sound collectives EPICAC Tropical Banda and Drei Ohne, and enjoys taking part in collaborative projects (such as Aura Cabral, the Archive of The 11th Hour, Die Diagonale, among others).

In Conversation With Manfred Mohr

The prominence of Manfred Mohr's art is testament to his committed exploration into the creative visual possibilities of algorithms. He was one of the earliest professionally trained artists to access computers and examine what it meant to allow the computer to generate, rather than merely execute, an artwork. Originally trained as a jazz musician and painter, Mohr introduced formal rules into his work after encountering the philosopher Max Bense whose ideas on programming the beautiful had a lasting impact. Upon moving to Paris, Mohr was equally inspired by the composer Pierre Barbaud who experimented with algorithmic compositions. Mohr created his first work with the computer in 1969 and by 1971 staged the first museum solo show of works entirely produced by a digital computer. Mohr's investigations in the geometric shape of the cube have been the driving force in his practice since 1973. Shaped by his musical background, he describes the cube in terms of a visual instrument. In 1978 his focus shifted to multidimensional hyper cubes. He charts paths through these spaces which are hard to imagine yet they are computable. The V&A is fortunate to have a significant number of art works by Mohr in its collection.

- Melanie Lenz (Digital Curator, V&A Museum)

Mimi Nguyen: Manfred, how did it all start in Paris?

Manfred Mohr: It wasn't that I woke up one morning and suddenly used code and a computer –– it was a very long thinking process in my life. I come from the abstract world of music. Music is always the basis of all my thinking. My early interest in visual art was therefore strongly influenced by jazz and classical modern music which was then reflected in a kind of action painting.

The problem was that I could not really control my artwork. In music I could write down tunes etc., but with action painting I had no real control.

It was only when I got into the philosophy of Max Bense's thinking in the early 1960's, that I understood, that a "rational" thinking in art, as Bense proposed, could solve that problem. One has to create the logic of what one wants to do before you start.

My artistic work therefore started and continues until today by dissecting and finding the inner logic of what I want to do. I create out of an abstract logic something which becomes visual.

Mimi Nguyen: P1680-B, Artificiata II, the work presented at the Paris Photo art fair this year, is a custom machine - the challenge of custom machinery presents unique setups and builds. Is that for preservation of your works?

Manfred Mohr: My interest is mainly in building and creating a visual solution to my ideas. I give as much written technical information and advice as I can with all my real time algorithmic animations, but in the end, your question refers to a problem for future conservators and restoration specialists.

Mimi Nguyen: There's also this noticeable equilibrium between order and chaos, akin to music. Going back to jazz as you mentioned before, how has your background influenced your practice?

Manfred Mohr: P1680-B (2014) is like a music score for a visual or electronic music. The content is rather technical but becomes a fascinating visual play. It shows the fracturing of a diagonal-path into even and odd numbered lines, where each change of direction indicates the passage through a dimension. (A diagonal path is a multiple-segmented line through an n-dimensional hypercube).

In this work n-dimensional diagonal-paths are shown with their even numbered lines in the left part and their odd numbered lines in the right part of the screen. Furthermore, the respectively missing lines are shown as compressed vertical lines along the sides of each part. The horizontal black lines crossing the vertices of the diagonal path invoke the association of a musical score, but are moving with respect to the rotation in space of each diagonal path. In a way, I could also answer this question in one sentence: “the visual result has to swing”.

Mimi Nguyen: What’s the interplay between your creative intuition and the algorithms you use? How do these collaborations influence your artistic decisions and the final artwork?

Manfred Mohr: That goes hand in hand. The algorithms, which I always write myself, are a direct result of my thinking. They are, so to speak, my guideline to a logical thinking.

Mimi Nguyen: Any challenges?

Manfred Mohr: The challenge for every artist is the same: having interesting ideas while trying to develop and realize them. All technical problems and everything surrounding them get solved automatically in time.

“Manfred Mohr began his career as a jazz musician and expressionist painter. He started exploring geometric imagery in the mid 1960s, producing his first computer-generated drawings in 1969. In this series of prints [Scratch Code: 1970-1975] produced from plotter drawings, the computer program creates a range of geometric shapes that echo some of his earlier artworks. Mohr went on to examine the possibilities presented by the cube.” - From the Gallery Label of the V&A Museum Collection (Text updated 14/8/2018)(07/07/2018-18/11/2018)

Melanie Lenz is the curator of Digital Art at the Victoria and Albert Museum. Based in London, she has over 20 years’ experience of curating, commissioning, and delivering creative projects. Specialising in digital arts and culture, Melanie co-curated Chance and Control: Art in the Age of Computers (2018-2019) and has published papers on early computer art in Latin America, gender and technology, collecting and conserving digital art. She has convened conferences on art, design and new technologies for health and has initiated art partnerships with a variety of organisations including Great Ormond Street Hospital. She is also a judge for the Lumen Prize.

In Conversation With Mario Klingeman

Klingemann's Teratoma series is a haunting exploration of the human form through the lens of early generative adversarial networks (GANs), AI models that the artist trained on a dataset of portraits and naked human bodies. These works are a form of 'neurography', a term coined by the artist to describe this form of image-making with neural networks instead of the camera. The black and white colour scheme lends the pieces a timeless quality, associating them with classical photography, whilst the GAN models used for their creation situate the works at a particular point in time in the development of AI technology. Early GAN models such as those used in this piece are known for making mistakes in their depiction of facial features, frequently misplacing the ears and eyes. Klingemann uses these to his advantage, creating an abstraction of the human face and body amongst fluid textures reminiscent of flesh, an image that takes the viewer time to assemble and comprehend. The title of Teratoma solidifies the link to the processes of the human body, drawing parallels between tumours made up of different tissues and the way GAN models process the dataset to generate images that mix up various body parts.

- Luba Elliot

Mimi Nguyen: AI - is it a tool or future artist?

Mario Klingemann: AI is an instrument. A "parascope"—an instrument of inspection—that allows us to observe and discover things which are beyond our reach, like the microscope or the telescope did before. But at the same time an instrument of creation and expression, like the piano. Can such an instrument eventually emancipate itself from its creators and become an artist itself? I do believe so, which is why I created "Botto" two years ago in order to find out. But having the technical potential to be an artist and becoming one is dependent on so many complex factors that it is still too early to tell.

Mimi Nguyen: How did your interest in utilising machine learning first emerge?

Mario Klingemann: I am driven by curiosity but at the same time I am also getting bored very quickly. What bores me most is if I reach the point in a process when I believe that I have understood the parameters that define a system, which makes the execution of that system just a matter of repetitively following a recipe. Which is when I look at ways to automate these processes so I don't have to waste my own time on them but can delegate these steps to a machine.

Coming from generative art I faced the problem that whilst I enjoyed the process of inventing, tweaking and exploring art-generating algorithms, the final step of having to curate the outputs that these systems gave me started to feel tedious at some point, since with any system that is worth exploring the ratio between "good" and "bad" results should be some somewhere in the range of 1% to 5%. And if you think that with such a low ratio maybe I am just very bad at writing my algorithms, I would say that if one finds 50% of a model's or an algorithm's output to be interesting then this is rather a problem of an underdeveloped taste.

This ratio means that one has to look at 99% mediocre results all the time in order to find the few pearls in the mud. So I started to look into ways how I could teach a machine to "see" like me and learn my aesthetic preferences. This was still back in 2007 when "machine learning" existed, but "deep learning" as we know it now was still not around. Given my background as an autodidact I had to first learn the very basics of image analysis and the ways images could be turned into meaningful numbers that would allow a machine to make

informed decisions whether an input had some aesthetic value. My early results were of course far away from what is possible now, but it did work and the little successes along the way got me hooked in trying to ever improve the ways I could make my machines “see” more and deeper.

And of course once deep learning came onto the stage I was hungry to discover all the new possibilities neural networks would give me - at first for classification only but soon afterwards for generation, too.

Mimi Nguyen: How do you manage to maintain a harmonious balance between human artistic intent and the generative capabilities of AI in your projects?

Mario Klingemann: Achieving that balance is quite the tightrope act. I like to think of it as conducting a sophisticated orchestra, where the AI and its generative abilities are the virtuoso players. You don’t dictate each and every note, instead, you give them the score, the mood, and the tempo. They interpret it, add their nuances and virtuosity, and you shape the collective sound. You listen attentively, guide gently, and every now and then, when needed, assert your direction more sharply. It’s a dance, really. One where the conductor needs to respect the orchestra just as much as the orchestra respects the conductor.

The role of the human artist in this context shifts from the creator to the curator, the director of the semi-autonomous processes. But these processes are to some extent shaped by the my ideas, preferences, and biases which makes every AI—based work just as much about me as about my systems.

Mimi Nguyen: What is “neurography” and how does it encapsulate your unique approach to working with neural networks and machine learning algorithms?

Mario Klingemann: I like to see myself as an explorer of new worlds and ideas—some people have called me a pioneer, which of course is very flattering—I guess in the end I am just not a big fan of crowds and like to go to places where I hope to find some solitude for a while. One perk (or maybe I should rather call it “urge”) of the explorer-type of person is that they can try to give things that they encounter on their journeys and which they believe to be unknown a new name. Someone at some point invented the term “Photography” which as we know now is the name that stuck, but back in those days there were a quite few contenders, I believe “Lumography” was one of them and of course Monsieur Daguerre managed to make us remember his name forever by naming his technique “Daguerreotype”.

So “Neurography” was my attempt to plant my flag in this new territory, by giving this new way of creating artificial images a name. It was in January 2017 when I realised that the concept of using the latent spaces of neural networks for generating images was a new paradigm which had the potential to become an entirely new medium of expression. My original definition was “Neurography - the process of framing and capturing images in latent spaces. The Neurographer controls locations, subjects and parameters”. One of the core concepts of neural networks is that of multidimensionality, but in the end this is not really a new thing - also classic photography can be framed as a multidimensional process that could be broken down in a list of parameters or variables: the time and location of where a photo is taken, the type of camera, lens, aperture, exposure time etc. - in the end could probably encode all these values into a 100 or 200-dimensional feature vector which - if we were able to rewind time - would allow us to take exactly the same photo again. But obviously that is impossible since traditional photographers (at least those who use a camera) are eventually bound by the natural laws.

The Neurographer on the other hand is unbound by them, or at least not bound by the same ones. Also and I think that is the most fascinating part about it - Neurographers can create their entirely new universes, each with their own rules and properties and each single model and its latent space comes with its own behaviors and character.

Mimi Nguyen: Can you tell us more about the Teratoma Series, that will be exhibited at the Paris Photo Art Fair this year?

Mario Klingemann: Teratoma are forms of tumours that produce different forms of human tissue in places where they do not belong: hair, skin, teeth etc. and like with any cancer it is our own mutated cells that do that which is why our immune-system does not perceive them as intruders. The models I employed for this series are trained on details of human body parts and since that is all they have learned and know about the world they inadvertently transform any kind of input into what is in their “DNA”: clusters of pixels that appear to us like deformed uncanny close-ups of human tissue. At moments they seem to make sense but then again they don’t and eventually land us in a perceptual limbo.

Mimi Nguyen: Your use of neural networks to create cameraless photography is fascinating. Can you walk us through the technical aspects of how you train your networks and what sources you feed into them to generate your images? What are the challenges and ethical considerations that you encounter while employing AI in your creative process?

Mario Klingemann: Whilst I understand the general curiosity to learn more about how the sausage is made—in particular if it is a technological one—I don’t think it is really something that I want to dive into too deeply. The same way it does not really help me to paint like Frida Kahlo if I knew which type of brush she used or to make photos like Robert Maplethorpe if I bought the same camera and lenses that he used will it not really be of much use for anyone if I outline the exact models and frameworks I use to make my art. In the end working with neural networks is a process of transformation, just like in any other art form. As in other art forms it is practice and experience that allows you to see the possibilities and limitations of your instruments and of course it is a learning process that never ends.

There is this idea of “first word art / last word art” which applies to any medium. First word art happens in the early phase of when a new medium is discovered and being explored. It often focuses on the technical novelties of that medium and rarely tries to make the medium become invisible again and only use its new possibilities to tell a story. It is also often about overcoming the technical challenges that a new medium might impose since it has not yet been turned into a convenience tool that everyone can operate without having to understand its inner workings. Last word art on the other hand is made by people who have mastered the medium and doesn’t need to fixate on the techniques—or gimmicks—any more, but can use it to make artworks that pay more attention to delivering a message, conveying an emotion or telling a tale.

“Teratoma’’ clearly belongs into the first-word art category since for me it was the result of trying to overcome several technical hurdles that the early generative networks put in my way: first of all was the problem that the model architectures and GPU in 2017 (at least the ones available to me) were by default outputting bitmaps of 256x256 pixels which as you can guess was not really sufficient to output anything that could be printed out at large size and hung on a wall. Actually, some artists did that nevertheless and surprisingly to me they got away with it since many people thought that blotchy

pixellated look is what AI art has to look like. For me that kind of quality was unacceptable so I spent months and months on research trying to improve model architectures to get bigger outputs with detailed textures.

A second problem was that all the publicly available pre-trained models that were out there at that time were kind of trained on "test data'' which consisted of categories that from an artistic perspective did not really seem very interesting: things like digital watches, fishes, cars or a never ending list of different dog breeds. What was almost entirely missing from these models were humans and high quality photography. Humans were in there almost only by accident: a guy holding a fish, a hand next to a digital watch or an eye behind sunglasses. So in order to get humans into these models I had to create my own datasets and train my own models. Getting lots of images was of course not a problem, all it took was writing some web-scrapers. Curating the images was already a bit more involved and initially a manual process, since in order to create categories of images to train my models on I first had to find images that fit into those categories. But the great thing about AI is that after a while it can learn what it is that I am looking for if I give it enough representative examples and can then find me more of the same on its own. It also helped me identifying and discovering other categories that were outside of what I was initially interested in by showing me thematic clusters based on the features of those images.

Once I had enough training material the next challenge was the training. It turned out that training a model is not as straightforward as it sounds like. It often felt like trying to put down a too-large carpet into a room that is too small: there was always some bubble popping up somewhere and if you flattened it then it popped up in a different corner. In practice this meant for example that I had managed to get my face model to generate very convincing eyes, but then it created nasty artefacts in the smoother skin areas. Trying to fix that by training more or changing the architecture resulted in nice skin details, but suddenly the eyes got smudged again. There seemed to be a limit as for how much such a model could learn which is for example the reason why the "Teratoma" series is black-and-white: by not having to learn colour the model had more capacity to focus on textures.

When it comes to ethics and AI I am quite uncompromising: models can be trained on any data that is publicly available to humans. If you do not want your data to be seen or read then do not put it into the public view. When it comes to what to do with the output of these models I believe that is in the responsibility of the person or artist discovering them: everyone intending to call an AI generated work "theirs" should exercise due diligence and research first how close it is to existing work out there and then decide if it encroaches on their territory or even worse accidentally plagiarises it.

Mimi Nguyen: As technology continues to advance, what do you envision the convergence of AI, photography, and art? What do you think of the off-the-shelf AI tools and how will they affect what we consider as art?

Mario Klingemann: My hope is that the shock and awe of the AI novelty effect will wane soon. After almost 10 years the story that something was "made with AI" should not really be the focus of our interest anymore but we should rather go back to the question of what the artist was trying to say with their work.

As for off-the-shelf AI tools, their proliferation was inevitable, just like it happened with the camera or the personal computer. When cameras were invented, not everyone could afford or operate them. Over time, they became accessible to the masses and today, we

all have a camera in our pocket. This has not devalued the craft of photography, on the contrary, it has made us more aware of the value of truly skilled photographers. I believe the same is already happening to AI art. Having access to the tools does not make one an artist automatically. Artistry lies not just in the craft, but in the unique ideas, the curiosity, the experimentation, the critique, and the perceived beauty or emotion. And we should never forget humour - something that we are pretty safe machines will not understand for quite a while, since it is one of the most sophisticated skills our wonderful human brain possesses.

One problem is see is the increasing fatigue we experience with the avalanche of creative work being unleashed upon us through all our channels. And I blame the off-the-shelf tools somewhat for worsening this effect since they are very biased towards certain “pretty” aesthetics and make it rather difficult to escape them in the streamlined and guard-railed creation process, which again gives the world the impression that AI art has to always look this way. But then again maybe this is exactly the chance for those who dare to create outside the common denominators to still find their niché for at least a while before it becomes popular.

Luba Elliott is a curator and researcher specialising in AI art. She works to educate and engage the broader public about the recent developments in AI art through talks and exhibitions at venues across the art, business and technology spectrum including The Serpentine Galleries, arebyte, ZKM, V&A Museum, Impakt Festival, CogX, NeurIPS and ICCV. Her recent projects include the Unit London exhibition ‘The Perfect Error’ and the ART-AI Festival in Leicester, UK.

She founded the NeurIPS Creativity and Design Workshop and curated the online galleries aiartonline.com and computervisionart.com. She is an Honorary Senior Research Fellow at the UCL Centre for Artificial Intelligence. Prior to that, she worked in start-ups, including the art collector database Larry’s List. She obtained her undergraduate degree in Modern Languages at the University of Cambridge